

1.1

Organizing and Interpreting Data

At a Glance

PACING 1½ days

Mathematical Goals

- Describe data distributions
- Use line plots and bar graphs to display data distributions

Launch

Engage students in a brief discussion of names.

- *Do you know anything interesting about how you were named or about the history behind your family's name?*

Use the Getting Ready to determine students' knowledge about collecting, organizing, and representing data. Have students determine exactly what they consider to be a full name.

- *Do you use nicknames or full first names?*

Show Transparency 1.1B, and then read Problem 1.1 aloud.

- *What do the X's on the line plot represent?*
- *What do the bars on the bar graph represent?*
- *What does each axis represent?*
- *How is the X above 17 in the line plot represented in the bar graph?*

Students work in pairs for Questions A–D, and in small groups for Question E. Summarize Questions A–D before you launch Questions E and F. Collect data and let students choose its organization and representation.

Materials

- Transparencies 1.1A and 1.1B
- Class list of students by first and last name (optional)

Vocabulary

- line plot
- bar graph

Explore

For Question C, help students move beyond counting X's on the line plot.

- *How could you find out the total number of letters in all their names using the bar graph?*

For those students struggling with Question D, you might ask:

- *What does it mean to have the most letters in a name versus the most frequent number of letters in a name?*
- *What is the name length that occurred with the greatest frequency in Ms. Jee's class? How did you figure that out?*

For Questions E and F, if students are confused, get them started by asking:

- *How do you think we should organize this information? Suppose you wanted to tell another class about our class's name lengths. It would be helpful to organize and display the data so you can see patterns and determine a typical name length.*

Encourage students to look at where the data cluster, at the high and low values, and at any unusual name lengths.

Opening: Tell which data will be explaining
Show 2 graphs

Summarize

Spend time discussing Questions C and D. For Questions E and F, give time to show and explain work. After students look at each other's graphs, ask:

- *Looking at the graphs, what do you think is the typical name length for a middle school student? Explain your thinking.*

If you focus on the distributions separately the students may answer the question in different ways. See if they mention, for example, the mean or the median. In focusing on both distributions together, put both sets of data on one graph and discuss what is typical.

Materials

- Student notebooks

ACE Assignment Guide for Problem 1.1



Core 1, 22–25

Adapted For suggestions about adapting ACE exercises, see the *CMP Special Needs Handbook*.

Answers to Problem 1.1

- A. Possible answers: There is one peak at a name length of 15 letters. The shortest name is 9 letters, and the longest name is 17 letters. Only two of the names are longer than 15 letters. Most of the name lengths cluster in the interval of 12–15 letters.
- B. Possible answers: Both graphs have titles and their axes are labeled. They have similar horizontal scales, which show the possible name lengths. The line plot does not have a vertical scale; the frequency of a particular name length is indicated by the number of X's above that number. The bar graph has a vertical scale; the frequency of a particular name length is indicated by the height of the bar over that number.
- C. For the bar graph, you could multiply the height of each bar by the name length each bar represents. For example, three people have nine letters in their name, so the bar over the 9 accounts for 9×3 , or 27, letters. Add the results for each bar to find the total number of letters. For the line plot, you could multiply the number of X's over each name length by that name length and add the results.
- D. The height of a bar does not represent a name length; it represents the number of people with a particular name length. Because Fahimeh is the only student who has a name with 17 letters, the bar over the 17 has a height of 1.
- E. Answers will vary.
- F. Answers will vary. Students may compare the distributions by focusing on their clusters or gaps. Although it is not expected, some may use statistical descriptors such as range, mean, mode, or median.